REMARKS

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Initially, as required by the Examiner, in response to the restriction requirement Applicants affirm their election of claims 15 and 18-20 drawn to a battery. This election is made while reserving Applicants' rights under 35 U.S.C. §121 to file a divisional application for the non-elected subject matter of claims 15-17 drawn to an electrolytic capacitor. Please note that such a divisional application was filed on June 10, 2002.

Accordingly, claims 16-17 have been cancelled from the present application.

In response to the objection to claim 15, this claim has been amended to delete reference to the electrolytic capacitor, thus rendering the objection moot.

Similar amendments have been made in the title of the invention and the Abstract of the Disclosure, thus rendering the objections to the title and abstract moot.

Attached hereto is a marked-up version of the changes made to the title, claims and abstract by the current amendment. The attached pages are captioned "**Version with markings to show changes made.**"

The patentability of the present invention over the disclosure of the reference relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

Thus, the rejection of claims 15 and 18-20 under 35 U.S.C. §102(b) as being anticipated by Yamada et al. is respectfully traversed.

Claim 15, which is the only independent claim under consideration, is directed to an impermeable or substantially impermeable electrode suitable for use in a battery, which comprises a substrate with an impermeable or substantially impermeable conductive layer of graphite on the substrate. The Examiner apparently acknowledges that the Yamada et al. reference fails to expressly disclose that the electrode described therein has an impermeable or substantially impermeable conductive layer of graphite, but nevertheless takes the position that the methods for producing the electrodes are the same as between the present invention and Yamada et al., and that the materials of the reference must also inherently be impermeable or substantially impermeable.

Applicants respectfully submit that this conclusion is flawed, because the methods for producing the electrodes are not the same as will be appreciated from the following remarks.

Yamada et al. disclose a carbon electrode comprising (a) a metal collector as catalyst, (b) a carbon material and (c) graphite particles, wherein the materials (b) and (c) were sintered together on (a) or in the presence of (a). The sintering conditions are not described in the reference, but according to the Examples the sintering is carried out at a temperature of 1,000°C (see e.g., Example 1, column 9, line 53), which is in harmony with the common definition of sintering as a heat incubation at a temperature of about 2/3 to 3/4 of the melting temperature of the involved substances (standard chemical literature).

In contrast to this, the impermeable electrodes suitable for use in a battery according to the present invention are produced in a quite different way. While sintering appears to be an essential process step in the production process for electrodes disclosed by Yamada et al. (see column 6, lines 15-23), the present invention, instead of such a sintering step, employs a drying step at 80-150°C to remove residual solvent and a subsequent heat treatment within a temperature range of 200 to 450°C to readjust the porous structure. These heat treatments are neither equivalent nor comparable to "sintering" as taught by Yamada et al.

Furthermore, the present invention need not make use of a metal substrate which serves to catalyze carbon graphitization as described in column 4, lines 24-25 of Yamada et al., but uses passive substrates. Moreover the metal substrate used in the present invention is preferably chemically or electrochemically pickled as described on page 4, lines 15-18 of the specification. By using substrates with a rough surface the compactness and impermeability of the resulting electrodes are enhanced. In contradiction to this, the method disclosed in Yamada et al. does not make use of such chemically or electrochemically etched substrates.

As demonstrated by these differences, the method of producing electrodes according to the present invention is not even similar to that disclosed in Yamada et al., let alone identical as proposed by the Examiner.

In conclusion, since the Yamada et al. reference fails to expressly disclose that the electrode has an impermeable or substantially impermeable conductive layer of graphite, and since the method

for producing the electrode in accordance with the present invention is significantly different from the method for producing the electrode in accordance with Yamada et al., there is no basis for concluding that Yamada et al. discloses an electrode having an impermeable or substantially impermeable conductive layer of graphite.

Applicants take the position that the rejection based on this reference should be withdrawn.

Therefore, in view of the foregoing amendments and remarks, it is submitted that the grounds of objection and rejection set forth by the Examiner have been overcome, and that the application is in condition for allowance. Such allowance is solicited.

Respectfully submitted,

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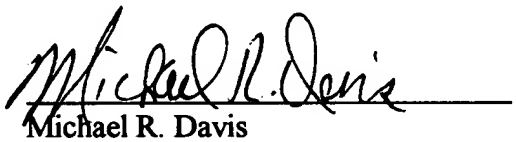
By: 

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ABSTRACT OF THE DISCLOSURE

An impermeable electrode for batteries, with an impermeable conductive layer of graphite, which is deposited from a suspension comprising graphite at a concentration between 1 and 50 g/l in an organic solvent on a substrate by immersion for a given length of time of, for example, approximately 10 to 60 seconds and wherein, after the deposition, the substrate with the layer of graphite is dried at a temperature between approximately 80 and 150°C for a given length of time of, for example, approximately 1 minute and, after the drying, is heat-treated at a temperature between approximately 200 and 450°C for a given length of time of, for example, approximately 5 to 60 minutes.

Version with Markings to Show Changes Made

[PROCESS FOR PRODUCING] AN ELECTRODE AND A BATTERY CONTAINING [USE OF] THE ELECTRODE

Version with Markings to Show Changes Made

9. The process according to claim 1, wherein a layer of the graphite is deposited on one side of the substrate.

10. The process according to claim 1, wherein a layer of the graphite is deposited on both sides of the substrate.

11. The process according to claim 1, wherein the organic solvent is an alcohol, a mixture of alcohols, or a carbonyl group-containing organic solvent.

12. The process according to claim 1, wherein the heat-treating is conducted in a controlled atmosphere or an inert gas atmosphere.

13. The process according to claim 12, wherein the inert gas atmosphere is a nitrogen or argon atmosphere.

14. The process according to claim 1, wherein the substrate has a thickness of approximately 15 to 55 μm.

15. An impermeable or substantially impermeable electrode suitable for use in ~~an electrolytic capacitor or~~ a battery, which comprises a substrate with an impermeable or substantially impermeable conductive layer of graphite on the substrate.

~~16.~~ An electrolytic capacitor comprising, as a cathode, a substrate with an impermeable or substantially impermeable conductive layer of graphite on the substrate, and an anode which has an oxide layer with dielectric properties.

~~17.~~ The capacitor according to claim 16, which is a supercapacitor which operates according to a principle of a Helmotz double layer and a diffusion layer.

18. A battery comprising, as a negative electrode, a substrate with an impermeable or substantially impermeable conductive layer of graphite on the substrate.

Version with Markings to
Show Changes Made

ABSTRACT OF THE DISCLOSURE

~~A process for producing an~~ impermeable electrode for ~~electrolytic~~ capacitors, ~~supercapacitors or~~ batteries, with an impermeable conductive layer of graphite, which is deposited from a suspension comprising graphite at a concentration between 1 and 50 g/l in an organic solvent on a substrate by immersion for a given length of time of, for example, approximately 10 to 60 seconds and wherein, after the deposition, the substrate with the layer of graphite is dried at a temperature between approximately 80 and 150 °C for a given length of time of, for example, approximately 1 minute and, after the drying, is heat-treated at a temperature between approximately 200 and 450 °C for a given length of time of, for example, approximately 5 to 60 minutes.